

flowering and fruiting continues from July until December, the main crop coming in the fall. The peduncles are 1-2 ins. long, and greatly exceed the scales which subtend them. The fruit is the size of a cherry, scarlet or deep purple, sometimes almost black at maturity. It is easily recognized by the conspicuous persistent calyx lobes. The flesh is sweet, juicy, and with an agreeable flavor. The fruits are eaten out of hand, and are also candied or preserved. The first plants in Hawai'i were probably introduced by the Spaniard, Don Francisco de Paula Marin, who came to the islands in 1791, and remained until his death in 1837. He introduced, cultivated, and distributed many useful plants. Fine trees of the Spanish Cherry occur in Pauoa, Ma-kiki, Nu'u-anu, and on old estates in various parts of the islands.

There are several other rare or undetermined exotic *Eugenias* in a few of the old Honolulu gardens, but the seven species that have been enumerated and described represent the bulk of the group in our flora. At one time in the early history of Hawaii's agriculture an endeavor was made to introduce the clove tree (*Eugenia aromatica* Baill), the flowers of which constitute the valuable cloves of commerce, but the enterprise was unsuccessful. Undoubtedly, as interest in Hawaiian horticulture grows and become more thoroughly organized, many of the other interesting members of this large group will find a place in the island flora.

COLLEGE OF HAWAII,
HONOLULU, HAWAII

HABENARIA REPENS AND PIAROPUS CRASSIPES IN LEON COUNTY, FLORIDA

BY ROLAND M. HARPER

Almost every outdoor botanist can recall several pairs of unrelated species that seem to be fond of each other's company, so to speak. In some cases one is evidently dependent on the other, *e. g.*, as parasite or epiphyte, but in most cases perhaps the only explanation is that they both prefer the same combination of environmental factors.*

* See A. A. Eaton, *Fern Bull.* 5: 29. 1897; Harper, *Torreya* 6: 192-193. 1906.

An interesting case of association, which may have some significance, is that of two aquatic monocotyledons of tropical and subtropical America, *Habenaria repens* Nutt., an orchid, and *Piaropus crassipes* (Mart.) Britton, the water-hyacinth. My

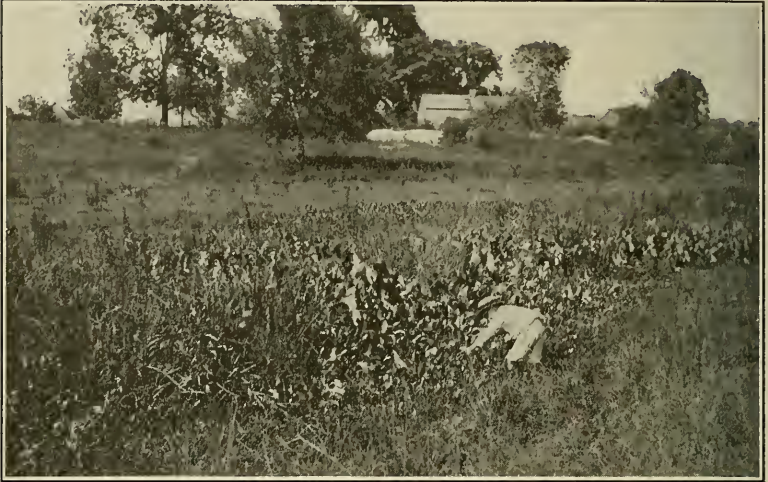


FIG. 1. Locality for *Habenaria repens* and *Piaropus crassipes*. Tallahassee, Fla. Sept. 11, 1914.

first meeting with both of these in a wild state was in Lowndes County, Georgia, in September, 1902.* There the orchid was supported by floating masses of the hyacinth in water several feet deep. About a year later I collected the *Habenaria* at the edge of the estuarine marshes of the Altamaha River just below Darien, Ga., and in 1908-9 I found both plants in marshes, lakes or streams at several places in central Florida, but never together. (Dr. J. K. Small, however, tells me that they associate in Lake Okeechobee. Both are reported from northern South America, but whether as associates or not is not stated.)

In 1914 I found the two plants intimately associated, and blooming at the same time, in a miry meadow near the southeastern corner of Tallahassee, Fla.; not floating, as they usually do elsewhere,† but the water-hyacinth rooting in the mud and the

* See *Plant World* 6: 164-165. July, 1903.

† In this connection see Ames, *Orchidaceae* 1: 51-53. 1905; Rusby, *Jour. N. Y. Bot. Gard.* 7: 112-115. 1906; Harper, *Ann. Rep. Fla. Geol. Surv.* 3: 293, 340, 342. 1911.

orchid partly supported on it. (See illustrations.) Neither can be indigenous there, because in pre-historic times the spot must have been covered with the hardwood forests that characterize that part of the state.* The whole vegetation of the meadow is of a type not uncommon in the Piedmont region of Georgia and other clayey regions farther north, but almost unknown in Florida, where sand is the prevailing soil component. The following are the characteristic plants of this place, in approximate order of abundance.

SHRUBS	HERBS
Cephalanthus occidentalis	Jussiaea leptocarpa
	Eupatorium perfoliatum
	Apios tuberosa
HERBS	Conoclinium coelestinum
Boehmeria cylindrica	Monniera Caroliniana
Sagittaria latifolia	Bidens trichosperma?
Polygonum hydropiperoides	Erianthus sp.
Piaropus crassipes	Lycopus sp.
Panicum gibbum	Diodia Virginiana
Juncus effusus	Kyllinga pumila
Habenaria repens	Cyperus Haspan
Cyperus flavescens	Bidens laevis?
Cyperus strigosus	Limnobium Spongia
Mikania scandens	Oldenlandia glomerata
Hypericum mutilum	Andropogon glomeratus
Aeschynomene Virginica	Ludwigiantha arcuata
Hydrocotyle umbellata	Anastrophus paspaloides
Fuirena breviseta	Xyris sp.
Fimbristylis autumnalis	Rhexia Mariana
Echinochloa Crus-Galli	

The wettest spots, where the two plants in question grow, probably produce vegetation at the rate of three or four tons (dry) per acre per year, or considerably faster than a typical sandy bog. Most of the species bloom in late summer, like the *Piaropus* and *Habenaria*. Some of them are evidently indigenous in that region and some are not, but there seems to be no way of getting at the history of the vegetation now.† The *Habenaria* was described from Georgia nearly 100 years ago, but

* See Ann. Rep. Fla. Geol. Surv. 6: 271-272. 1914.

† The development of wet meadows in the eastern United States and other temperate regions presents some unsolved problems. Some botanists seem to believe that such meadows are the result of clearing long ago and pasturing or haying ever since, but the fact that in many such places the plants are all or nearly

the *Piaropus* was not known as a wild plant in the United States until about 25 years ago.* From the manner in which they associate in Tallahassee it is not likely that the *Habenaria* was there first, and they both may have been introduced at the same time, perhaps by means of seeds carried on the feet of aquatic



FIG. 2. Near view of the plants. Flowers and foliage of *Piaropus* in foreground and several spikes of *Habenaria* and leaves of *Sagittaria latifolia* a little farther back.

birds. The introduction may have been quite recent, for I made my headquarters in Tallahassee during most of 1909 and 1910, without seeing either plant then, though the water-hyacinth is quite conspicuous when in bloom, and easily visible now from a railroad along which I often rode and walked.

COLLEGE POINT,
LONG ISLAND

all native distinguishes them sharply from most unnatural habitats. For descriptions of more or less similar vegetation in other states see Blankinship, *Rhodora* 5: 131, 132. 1903 (Mass.); Nichols, *Bull. Torrey Club* 42: 192. 1915 (Conn.); Harshberger, *Bull. Torrey Club* 31: 153. 1904 (Pa.); Harper, *Torreya* 10: 63. 1910 (N. C.); *Bull. Torrey Club* 27: 322, 416. 1900 (Ga.).

* See Small, *Bull. Torrey Club* 23: 125. [1896; Webber, U. S. Dept. Agr., Div. Botany, *Bull.* 18. 1897; Curtiss, *Plant World* 3: 38-30. 1900.